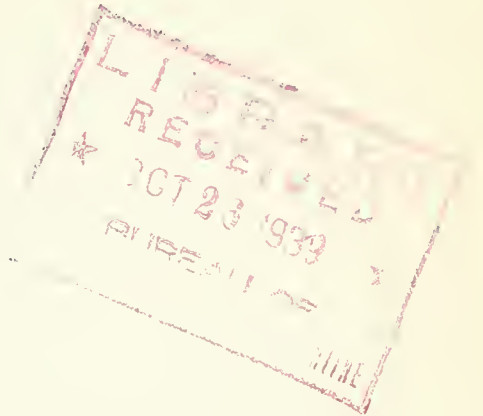


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ESTIMATES OF DAMAGE BY THE EUROPEAN CORN BORER IN 1938
AND A COMPARISON WITH 1937 ESTIMATES

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A significant item in the consideration of the economic importance of an injurious insect, aside from information on the potential menace of the pest to crop production and the effect of its presence on agricultural practices, is an estimate of the money damage being caused by the insect over the area of its distribution. For the purpose of presenting a conservative picture of the economic importance of the European corn borer as a corn pest in 1938, gross estimates were prepared of the damage caused by the insect, both to corn harvested for grain and to sweet corn, within that portion of the infested territory surveyed in the fall of 1938 to determine its relative abundance. Although these estimates are necessarily approximate, it is believed that they are based on sound calculations and are sufficiently accurate for practical use. Comparison has been made between estimates of damage for 1937 and 1938, basing the data for both years on the more restricted area surveyed in 1938. No direct comparison should be attempted between the 1937 and 1938 estimates of corn borer damage considered in this report and any yearly estimates presented previously in other reports, because the areas involved are not comparable.

To obtain percentages of loss for corn borer infestations of different intensities, established damage indices of 3-percent loss per borer per plant in corn harvested for grain, and of 8-percent loss per borer per plant in sweet corn, were applied to the average number of borers per 100 plants per county or county group as determined from the fall-infestation survey. The same average borer population figures were utilized for both types of corn in all cases except that for sweet corn in New Jersey in 1938. An extreme exaggeration of loss by the corn borer in 1938 would have resulted from the utilization of the high population figures for the fall or second generation of the insect that year in New Jersey in calculating the damage to the rather extensive acreage of sweet corn in surveyed parts of the State, the greater part of which was affected principally by the much lighter first generation of the borer. Consequently the percentage of loss calculated for the lower borer populations found in New Jersey in 1937 was applied to the 1938 values of the sweet corn crop in the surveyed counties of the State. Figures on grain-corn production in bushels were derived from the 1935 Agricultural Census, and estimates of sweet corn production were obtained by multiplying the county acreages of this crop given in the census by an average yield of 800 dozen ears per acre. All acreage figures were taken from the census. Crop values were obtained by applying current prices to the corn-production data, and the estimated borer damage in dollars as computed from the figures on crop value and the calculated percentage of loss by the insect.

The 1937 and 1938 prices of corn harvested for grain were procured from the Bureau of Agricultural Economics, and weighted averages of the figures for the infested States involved in the survey were used in the preparation of the estimates. The 1938 per-bushel quotation is preliminary. Per-dozen prices of sweet corn were obtained by averaging daily quotations for the season from data supplied by various State, Federal, and city marketing agencies. In the calculations the following prices were utilized.

1937: Corn harvested for grain, 52 cents per bushel.
Sweet corn (per dozen ears)--Michigan, Ohio, and Indiana, 16 cents; western New York, 15 cents; Connecticut, 19 cents; New Jersey, Delaware, Maryland, and Virginia, 14 cents.

1938: Corn harvested for grain, 52 cents per bushel.
Sweet corn (per dozen ears)--Michigan, Ohio, and Indiana, 11 cents; western New York, 10 cents; Connecticut, 21 cents; New Jersey, 15 cents; Delaware, Maryland, and Virginia, 10 cents.

Table 1 presents the estimates compiled on corn borer damage in 1937 and 1938, and the following discussion contains the more important conclusions to be drawn from the data.

The comparable infested territory surveyed in 1937 and 1938 was composed of the following: 1,348,321 acres of corn harvested for grain, with an estimated crop value of \$20,829,296, and 33,280 acres of sweet corn, with an estimated crop value of \$4,096,176 in 1937 and \$3,733,952 in 1938. The combined acreage of grain and sweet corn was 1,381,601 and the estimated crop value of both was \$24,925,472 in 1937 and \$24,563,248 in 1938. The difference in value of the crop in 1937 and 1938 was due to variation in the current market prices of sweet corn in these 2 years.

The estimated total loss by the European corn borer to the above crop was \$1,186,768 in 1937 and \$1,586,833 in 1938, or an increased loss of \$400,065 in the latter over the former year. The estimated loss in 1938 was divided as follows: Corn harvested for grain, \$814,871 (51.4 percent of the entire loss), and sweet corn, \$771,962 (48.6 percent of the entire loss). In 1937 the proportions of total loss were 37 percent in grain corn and 63 percent in sweet corn.

In the Lake States area in 1938 the loss caused by the corn borer to corn harvested for grain was estimated at \$594,495 (83.3 percent of the entire loss in that area), and to sweet corn at \$119,140 (16.7 percent of the entire loss), or a total of \$713,635.

In the Eastern States area in 1938 the loss caused by the corn borer to corn harvested for grain was estimated at \$220,376 (25.2 percent of the entire loss in that area), and to sweet corn, at \$652,822 (74.8 percent of the entire loss), or a total of \$873,198.

In other words, practically one-half of the total damage by the European corn borer in 1938, within the surveyed areas, occurred in sweet corn, and one-half in corn harvested for grain. In the Lake States five times as much of the loss was in corn harvested for grain as in sweet corn, whereas in the Eastern States three

fourths of the damage was in sweet corn.

The average calculated loss of crop by the corn borer in 1938 for the entire area surveyed, based on the application of damage indices to populations of the insect, was 7 percent in corn harvested for grain and 13.3 percent in sweet corn. The average per acre loss in 1938 for grain corn was estimated at \$0.60 and for sweet corn, at \$23.20. In comparison, the average per acre loss in 1937 for grain corn was estimated at \$0.33 and for sweet corn, at \$22.46.

On the basis of available information from other parts of the infested region in addition to those actually surveyed, the total amount of damage caused by the European corn borer in 1938 in the United States is placed conservatively between 2 and 2 $\frac{1}{2}$ million dollars.

Table 1.—Estimates of damage caused by the European corn borer to corn harvested for grain, and to sweet corn in comparable areas, in 1937 and 1938

Areas surveyed	Extent of areas surveyed	Estimated value of crop in 1937 and 1938	Estimated loss of crop by corn borer in 1937 and 1938	Per acre loss of: Calculated loss of crop value by corn borer in 1937 and 1938	of yield by corn borer in 1937 and 1938
	Acres	Dollars	Dollars	Dollars	Percent
Lake States area ^{2/}					
Corn harvested for grain—	1,124,216	17,762,357	17,762,357	361,743	594,495
Sweet corn—	13,557	1,727,600	1,186,120	159,940	119,140
Total—	1,137,753	19,489,957	18,948,477	521,683	713,635
Eastern States area ^{2/}					
Corn harvested for grain—	224,105	3,066,939	3,066,939	77,419	220,376
Sweet corn—	19,743	2,368,576	2,547,832	587,666	652,822
Total—	243,848	5,435,515	5,614,771	665,085	873,198
Both areas:					
Corn harvested for grain—	1,348,321	20,829,296	20,829,296	439,162	814,871
Sweet corn—	33,280	4,096,176	3,733,952	747,606	771,962
Grand total—	1,381,601	24,925,472	24,563,248	1,186,768	1,586,833
				0.86	1.15
				7.5	10.1

^{1/} Based on application of damage indices to corn borer populations.

^{2/} Comprises the following comparable counties and county groups: Lenoire, Macomb, Monroe, St. Clair, Washtenaw, and Wayne, in Michigan; Defiance, Fulton, Hancock, Henry, Lucas, Ottawa, Paulding, Putnam, Sandusky, Seneca, Williams, and Wood, in Ohio; Adams-Blackford-Jay-Wells, Allen-De Kalb-Stauben, and Huntington-Noble-Whitley, in Indiana; and Jefferson-Oswego in New York.

^{3/} Comprises the following comparable counties and county groups: Hartford and New Haven, in Connecticut; Burlington, Middlesex, and Monmouth, in New Jersey; Sussex, in Delaware; Wicomico-Worcester, in Maryland; and Accomac-Norhampton, in Virginia.